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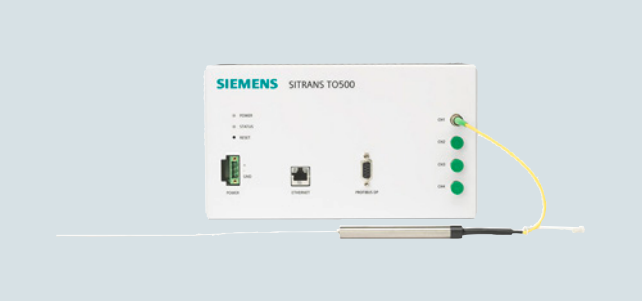
Overview



SITRANS TO500 is a multipoint temperature transmitter for measuring temperatures and temperature profiles using fiber optic multipoint temperature measurement lances.

Benefits

- Evaluation of a large number of sensors (fiber Bragg grating (FBG)) in one temperature transmitter
- Low space requirement of the measurement lances
- 4 measuring lance channels per transmitter
- Easy to install
- PROFIBUS DP - Simple integration into control system
- Fast response to temperature changes
- Exact, no recalibration required due to internal reference
- Also suitable for high process temperatures

Application

The SITRANS TO500 is used for evaluating a large number of sensors arranged on a fiber optic multipoint temperature measurement lance.

Up to 4 measurement lances with up to 48 sensors (fiber Bragg grating (FBG)) each can be processed simultaneously by a SITRANS TO500.

Accurate and fast determination of temperature profiles enables process optimization in terms of service life, quality and output.

Locations of excessive temperature rise are quickly and accurately detected, thereby preventing damage to the process, equipment and environment.

Wherever temperature profiles must be determined and installation space is limited, the SITRANS TO500 with fiber-optic temperature measurement is the right choice.

Design

The SITRANS TO500 multipoint temperature transmitter is located in the control cabinet in a compact aluminum enclosure for mounting onto DIN rails.

The connectors are easy to access on the front:

- 4 x connector for measurement lances
- 1 x connector for power supply
- 1 x connector PROFIBUS DP
- 1 x connector Ethernet

The status displays are also located on the front.

Mode of operation

In the SITRANS TO500 multipoint temperature transmitter, light is generated in the wavelength of 1500 to 1600 nm and output to the measurement lance by means of a continuously tunable laser light. Fiber Bragg gratings (FBG) are mounted at defined measurement points on the measurement lances. Each FBG reflects light of a defined wavelength. The wavelength reflected by the FBGs varies as a function of temperature. The reflection at the FBG is thus a measure of the temperature at the respective measurement point. Up to 48 FBGs gratings per channel can be evaluated, depending on the temperature range.

A gas cell with fixed absorption line serves as a reference in the SITRANS TO500 and the wavelength determination is continuously adjusted by it.

Function

The SITRANS TO500 has 4 channels which are evaluated simultaneously. The wavelength reflected at each sensor in the multipoint temperature measurement lance depends on the temperature, and this wavelength is output in the multipoint temperature transmitter. The temperature can be determined and displayed accurately at up to 48 sensors per channel. The positions of the sensors can be specified by the customer. This leads to a flexible and application-specific solution for the customer.

The measured temperatures are transferred to the control system via PROFIBUS DP. The parameters of the SITRANS TO500 are set via the integrated Ethernet interface.

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Technical specifications

Input	
Channels	4
Measured variable	Temperature
Input type	Max. 48 sensors (FBGs) per channel
Characteristics	Temperature-linear
Resolution	0.1 K
Measuring accuracy	< 0.5 K
Repeatability	< 0.5 K
Measuring cycle	< 1 s
Measuring range	-180 ... +800 °C (-292 ... +1472 °F) depending on the measurement lance
Unit	°C
Power supply	24 V DC + 20 %
Power consumption	Max. 15 W
Protection	Against reverse polarity
Measuring velocity	
• Measurement rate	1 Hz independent of the number of FBGs
Output	
Output signal	PROFIBUS DP
Optical power	≤ 1 mW per channel
Laser protection class	Class 1
Rated conditions	
Ambient conditions	
Ambient temperature	0 ... 50 °C (32 ... 122 °F)
Storage temperature	-40 ... +85 °C (-40 ... +185 °F)
Relative humidity	< 80%, non condensing at 50 °C (122 °F)
Electromagnetic compatibility	According to EN 61326 and NAMUR NE21
Degree of protection to EN 60529	
Enclosure	IP20
Design	
Weight	2.4 kg (5.3 lb)
Dimensions	See "Dimensional drawings"
DIN rail adapter	Rear-mounted
Material	Aluminum
Displays and control elements	
LEDs	"Power-on" (continuous light) "Status" (flashing during startup; otherwise continuous light)
Pushbutton	"Reset" (system restart or address reset)

Selection and Ordering data

	Article-No.
SITRANS TO500 multipoint temperature transmitter Communication: PROFIBUS DP Channels: 4 Power supply: 24 V DC Optical connection: FC/APC plug Enclosure: Aluminum, IP20	**7NG9551-4AA00-0AA0**

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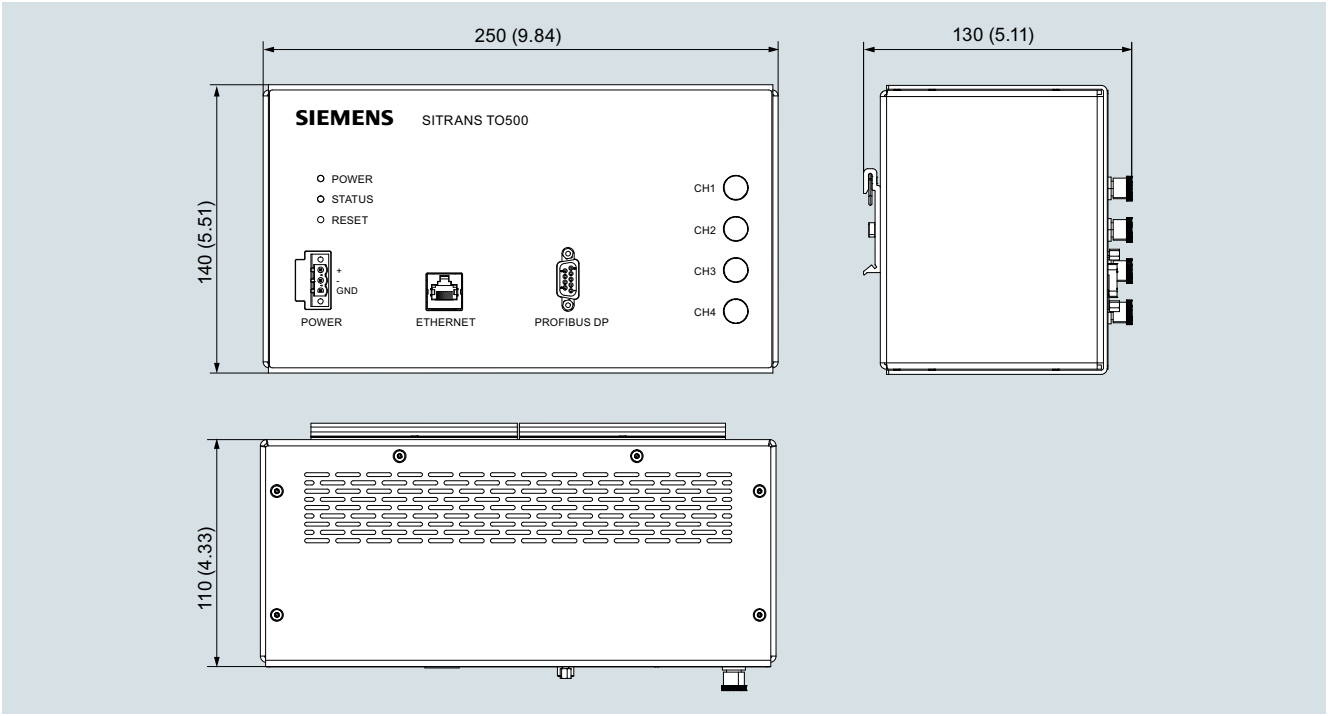
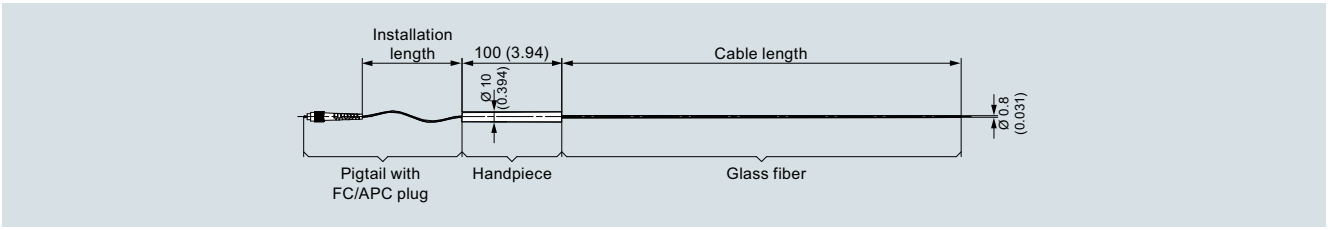
Dimensionsal drawings

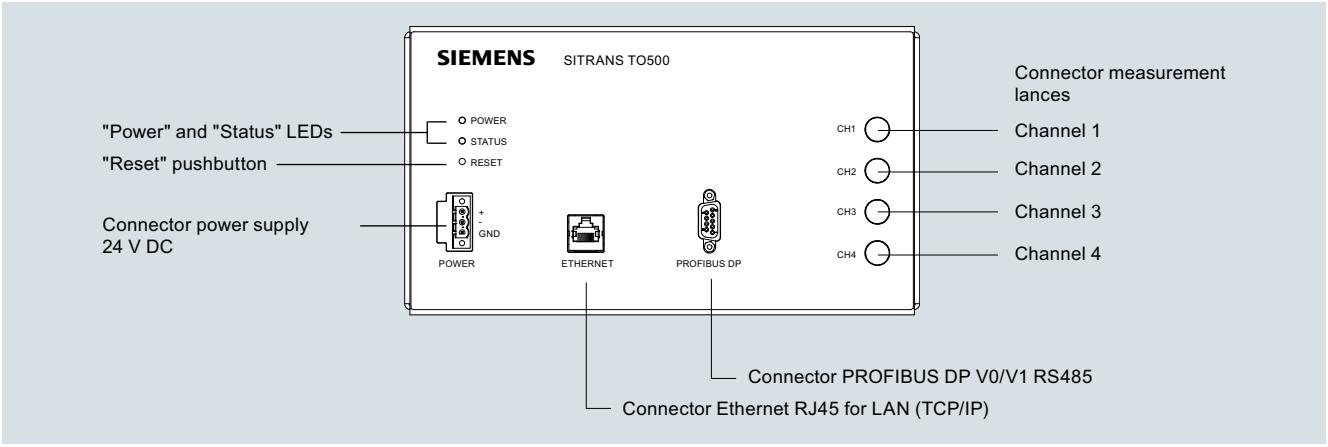


SITRANS TO500, front, rear and side view; dimensions in mm (inch)



Measuring lance with FC/APC connector, pigtail and handpiece; dimensions in mm (inch)

Schematics



SITRANS TO500, connector assignment